

Service Manual

C123

ORDER NO. TD89060343C2

FM/AM/FM Stereo Radio

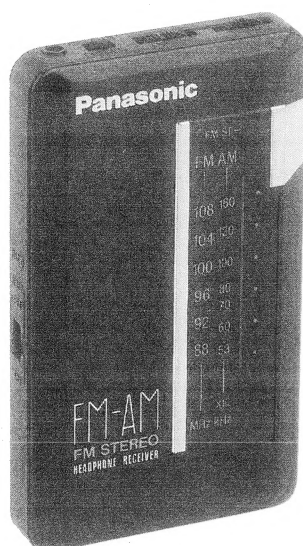
Radio
RF-423

Color

(K)..... Black Type

Area

Country Code	Areas	Color
[Z]	Continental Europe.	(K)
[ZG]	F. R. Germany and Italy.	
[ZY]	Spain and Greece	



■ SPECIFICATIONS

Power Requirement: DC 3V; Two UM-4
(Panasonic R03/LR03 batteries)

Frequency Range: FM 87.5~108MHz
AM 520~1610kHz (577~186m)

Intermediate Frequency: FM 10.7MHz
AM [Z]/[ZY]...459kHz
[ZG].....455kHz

Sensitivity: FM 4.5 μ V for 1mW Output
(-3dB, Limit, Sens.)
AM 200 μ V/m for 1mW Output

Power Output: 40mW (20mW \times 2) RMS. Max

Dimensions: 62(W) \times 109(H) \times 18(D)mm

Weight: 123g Without Batteries

Impedance: Headphone Jack.....32 Ω (3.5)

● Featherweight Stereo Innerphones

Input: 4mW (Max. 40mW)

Impedance: 16 Ω

Connection Cord: 110cm

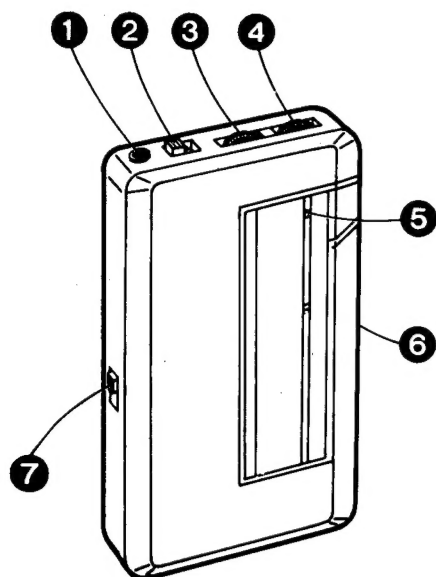
Weight: 14.5g with cord

Design and specifications are subject to change without notice.

Panasonic

Matsushita Electric Industrial Co., Ltd.
Central P.O. Box 288, Osaka 530-91, Japan

LOCATION OF CONTROLS



- ① Headphone Jack (ϕ) $\phi 3.5, 32\Omega$
- ② Power Switch (POWER)
- ③ Volume Control (VOLUME)
- ④ Tuning Control (TUNING)
- ⑤ FM Stereo Indicator (FM ST)
- ⑥ Battery Compartment [Back]
- ⑦ Band Selector (BAND)

DISASSEMBLY INSTRUCTIONS

■ Removal of the Front Cabinet

1. Remove the Front Cabinet in the direction of arrow (1). (Fig. 1)
2. To prevent damaging of cover is necessary to place a piece of cloth under screwdriver.

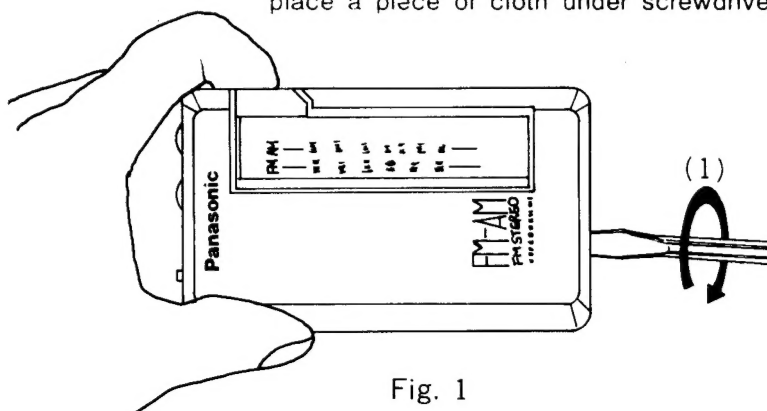


Fig. 1

■ Removal of the PC. Board

1. Pull out the PC Board with driver. in the direction of arrow (2) as shown in (Fig. 2)
2. Remove the PC. Board in the direction of arrow (3) as shown in (Fig. 3)

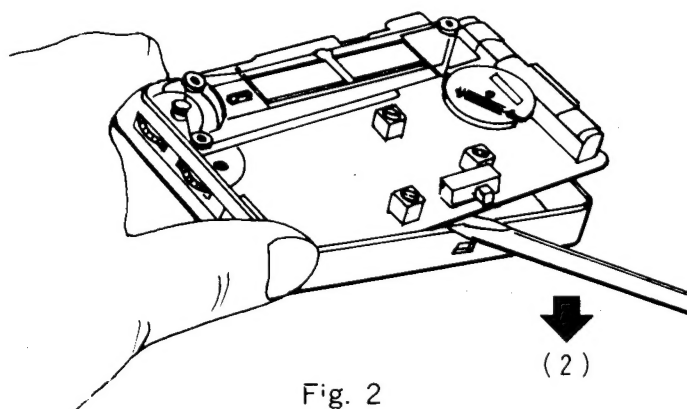


Fig. 2

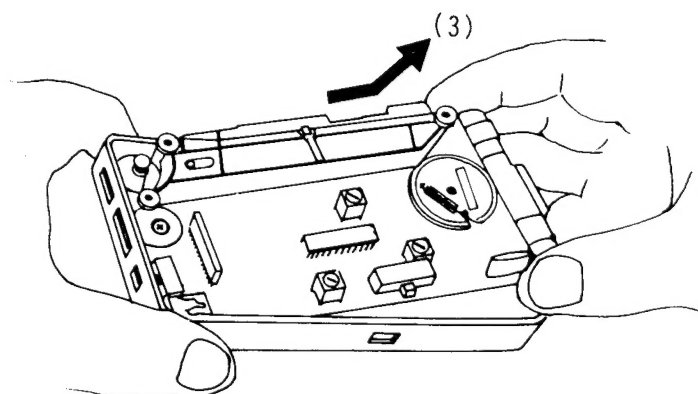


Fig. 3

MEASUREMENTS AND ADJUSTMENTS

ALIGNMENT INSTRUCTIONS

READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT					
Notes: 1. Set volume control to maximum. 2. Set band switch to AM or FMST. 2. Set power switch to ON. 4. Set power source voltage to 3 volts DC. 5. Output of signal generator should be no higher than necessary to obtain an output reading.					
SIGNAL GENERATOR or SWEEP GENERATOR		RADIO DIAL SETTING (DISTANCE)	INDICATOR (ELECTRONIC VOLTMETER or SCOPE)	ADJUSTMENT	REMARKS
CONNECTIONS	FREQUENCY				
AM-IF & RF ALIGNMENT					
(1)	Fashion a loop of, Several turns of wire and radiate signal into loop of receiver.	459kHz (455kHz[ZG]only) 30% Mod. at 400Hz	Point of non-interference. (on/about 600 kHz)	Headphones Jack (32Ω) (Fabricate the plug as shown in Fig. 9, and then connect the lead wires of the plug to the measuring instrument.)	T2 (AM 1st IFT) Adjust for maximum output.
(2)	"	511 kHz (514kHz...[ZG] only)(f.min)	Tuning capacitor fully closed.	"	L4 (AM OSC Coil) "
(3)	"	1650kHz (1633kHz...[ZG] only)(f. Max)	Tuning capacitor fully open.	"	CT3 (AM OSC Trimmer) "
(4)	"	550 kHz	Tune to signal.	"	(*1)L3 (AM ANT Coil) Adjust for maximum output. Adjust L3 by moving coil along ferrite core.
(5)	"	1500 kHz	Tune to signal.	"	CT4 (AM ANT Trimmer) Adjust for maximum output. Repeat steps (2)~(5)
(*1) Fix antenna coil with wax after completing alignment.					
FM-IF ALIGNMENT					
(6)	High side thru. 0.001μF to point ▼ Negative side to point ▼	10.7 MHz	Point of non-interference. (on/about 90 MHz).	Connect vert. amp. of scope to point ▼ Negative side to point ▼	T1 (FM 1st IFT) Adjust for maximum amplitude. (Refer to fig. 4).
(7)	"	"	"	"	T3 (FM 2nd IFT) Adjust for maximum amplitude. (Refer to fig. 5).
FM-RF ALIGNMENT					
(8)	Connect point ▼ through FM dummy antenna Negative side to point ▼ (Refer to fig. 6.)	86.2MHz 87.3MHz...[ZG] only)(f.min)	Tuning capacitor fully closed.	Headphones Jack (32Ω) (Fabricate the plug as shown in Fig. 9, and then connect the lead wires of the plug to the measuring instrument.)	L2 (FM OSC Coil) (*2) Adjust for maximum output.
(9)	"	109.2MHz (108.3MHz...[ZG] only)(f. Max)	Tuning capacitor fully open.	"	CT1 (FM OSC Trimmer) "
(10)	"	90 MHz	Tune to signal.	"	L1 (FM ANT Coil) "
(11)	"	106 MHz	Tune to signal.	"	CT2 (FM ANT Trimmer) Adjust for maximum output. Repeat steps (8)~(11).
(*2) Three output responses will be present; proper tuning is the center frequency.					

SEPARATION ALIGNMENT

ITEM	FM SIGNAL GENERATOR SOURCE CONNECTION	EQUIPMENT CONNECTION ELECTRONIC COUNTER	ADJUSTMENT	SPECIFICATON	REMARKS
Adjustment of pilot signal.	90 MHz, 60 dB Connect to test point ▼ through FM dummy antenna. Negative side to test point ▼	▼...(+)side ▼...(-)side	VR1	19 kHz	Adjust VR1 for 19 kHz (±150Hz) reading on electronics counter.

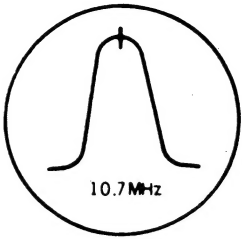


Fig. 4

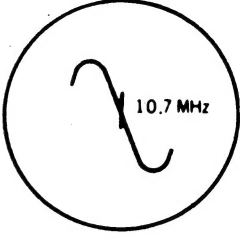


Fig. 5

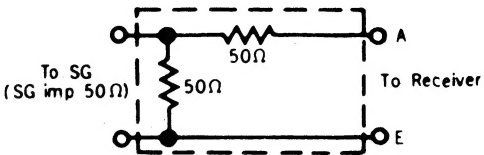


Fig. 6

ALIGNMENT POINTS

● Please refer to the Circuit Board and Wiring Connection Diagram to locate the test points.

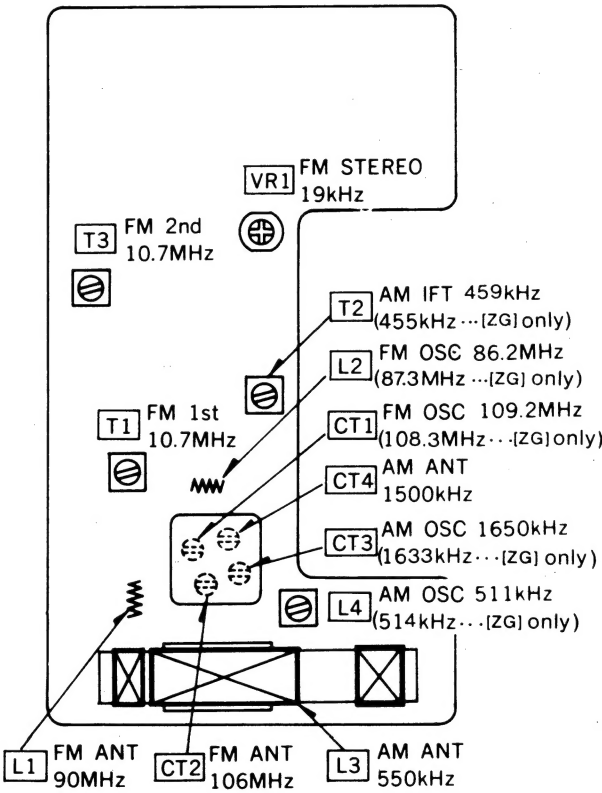


Fig. 7

DIAL THREADING

DIAL CORD LENGTH: 30cm (12")

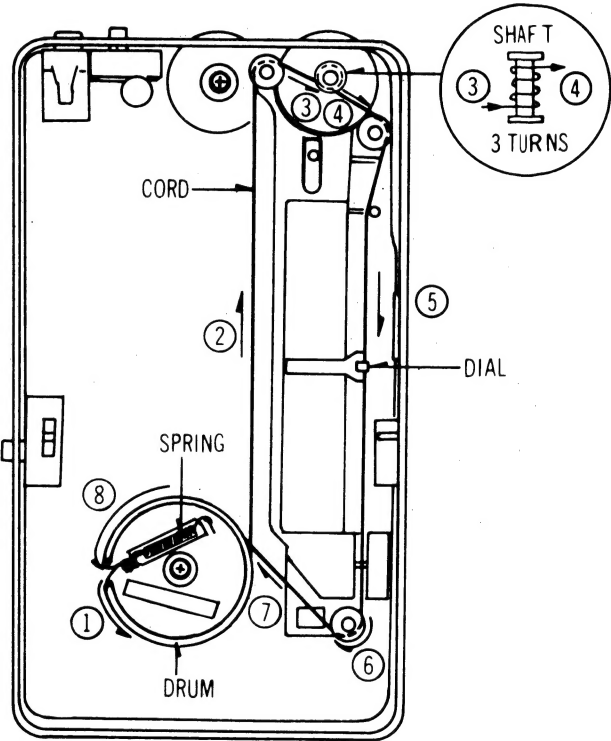


Fig. 8

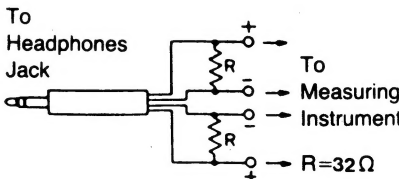
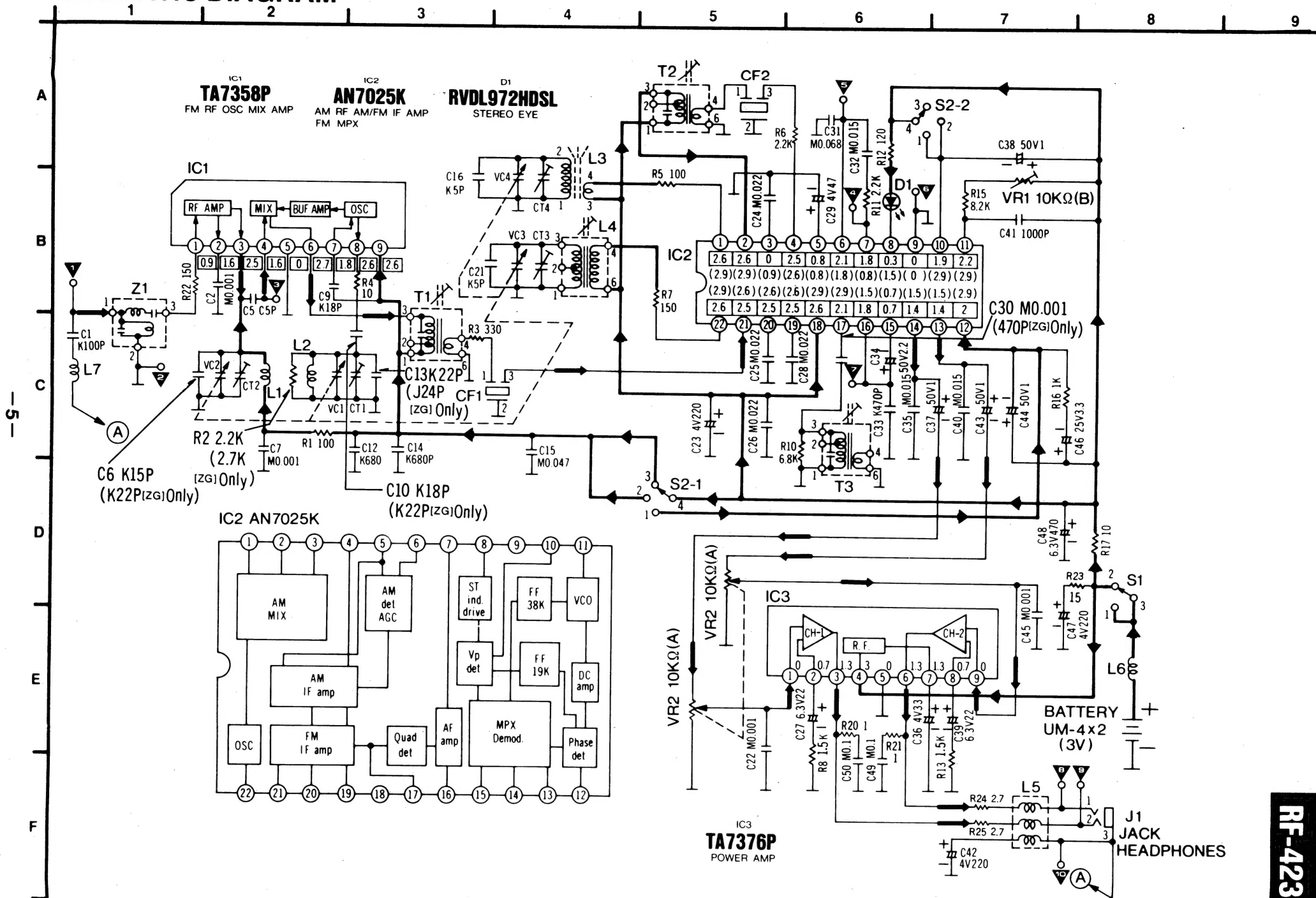
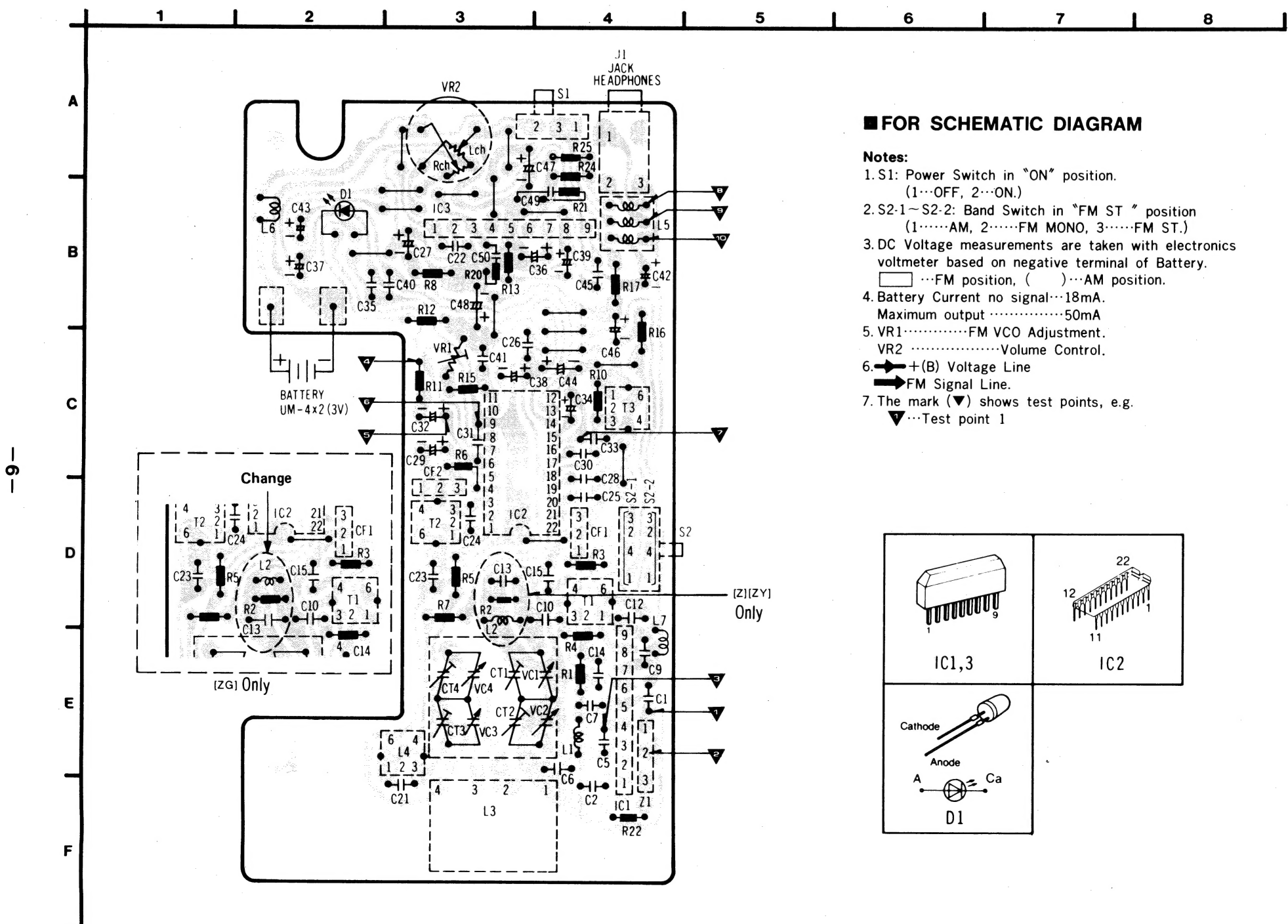


Fig. 9

SCHEMATIC DIAGRAM



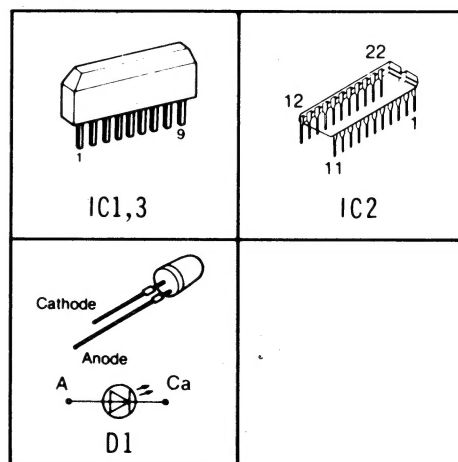
CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM



FOR SCHEMATIC DIAGRAM

Notes:

1. S1: Power Switch in "ON" position.
(1...OFF, 2...ON.)
2. S2-1~S2-2: Band Switch in "FM ST" position
(1...AM, 2...FM MONO, 3...FM ST.)
3. DC Voltage measurements are taken with electronics
voltmeter based on negative terminal of Battery.
□...FM position, ()...AM position.
4. Battery Current no signal...18mA.
Maximum output50mA
5. VR1.....FM VCO Adjustment.
VR2Volume Control.
6. + (B) Voltage Line
→ FM Signal Line.
7. The mark (▼) shows test points, e.g.
▼...Test point 1



RF-423 RF-423

RESISTORS & CAPACITORS PARTS LIST

Numbering System of Resistor

Example:

ERD	25	F	J	102
Type	Wattage (1/4W)	Shape	Tolerance	Value (1K Ω)
ERX	2	AN	J	471
Type	Wattage (2W)	Shape	Tolerance	Value (470 Ω)

Numbering System of Capacitor

Example:

ECKD	1H	102	Z	F
Type	Voltage (50V)	Value (0.001 μ F)	Tolerance	Peculiarity
ECEA	50	M	330	
Type	Voltage (50V)	Peculiarity	Value (33 μ F)	

※ Capacity is stated in microfarads (μ F) unless specified otherwise, P=Pico-farads.

※ Resistance is stated in ohms (Ω), unless specified otherwise, 1K=1,000 Ω , 1M=1,000K Ω

Resistor Type	Wattage		Tolerance
ERD : Carbon	10 : 1/8W	12 : 1/2W	J : $\pm 5\%$
ERG : Metal Oxide	14 : 1/4W	25 : 1/4W	F : $\pm 1\%$
ERQ : Fuse Type Metal	1A : 1W	18 : 1/8W	G : $\pm 2\%$
ERX : Metal Film	S2 : 1/4W	S1 : 1/2W	J : $\pm 5\%$
ERD L : Carbon (chip)	2F : 1/4W	50 : 1/2W	K : $\pm 10\%$
ERO K : Metal Film (chip)	2A : 2W	3A : 3W	M : $\pm 20\%$
ERC : Solid	6G : 1/10W	8G : 1/8W	
ERF : Incombustible Box-Shaped			
ERM : Wire-Wound			
RRJ : Cip Resistor			
ERJ : Cip Resistor			

Capacitor Type	Voltage		Tolerance
ECE : Electrolytic	0J : 6.3V	1A : 10V	K : $\pm 10\%$
ECCD : Ceramic	1C : 16V	1E : 25V	M : $\pm 20\%$
ECKD : Ceramic Capacitor	1H : 50V	1V : 35V	Z : $\pm 80\%$
ECQM : Polyester	50 : 50V	05 : 50V	-20
ECQP : Polypropylene	2H : 500V	2A : 100V	J : $\pm 5\%$
ECG : Ceramic	1 : 100V	1J : 63V	G : $\pm 2\%$
ECEA N : Non Polar Electrolytic	KC : 400V AC		F : $\pm 1\%$
QCU : Ceramic (Chip Type)	KC : 125V AC		C : $\pm 0.25\mu$ F
ECUX : Ceramic (Chip Type)	(UL)		D : $\pm 0.5\mu$ F
ECF : Semiconductor			
EECW : Liquid electrolyte double layer capacitor			

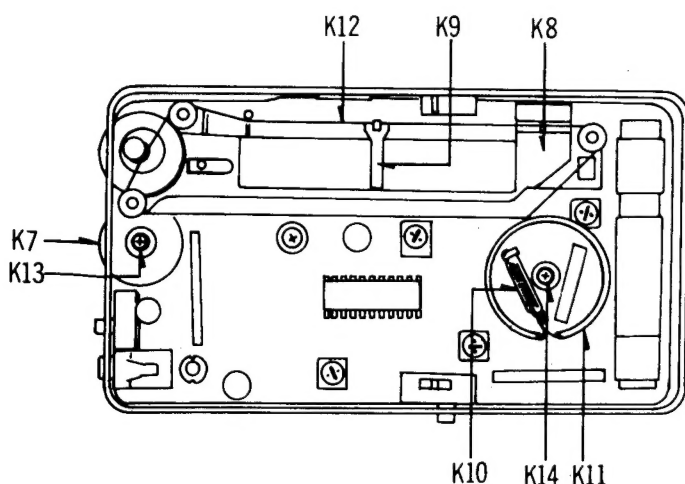
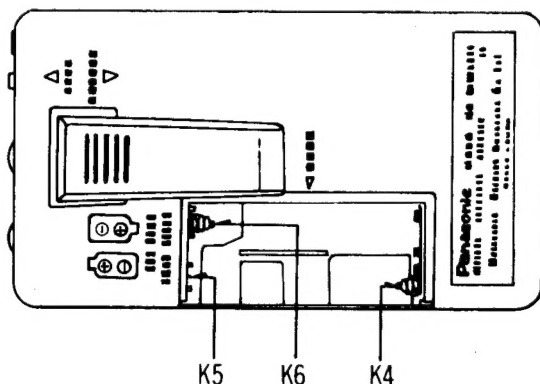
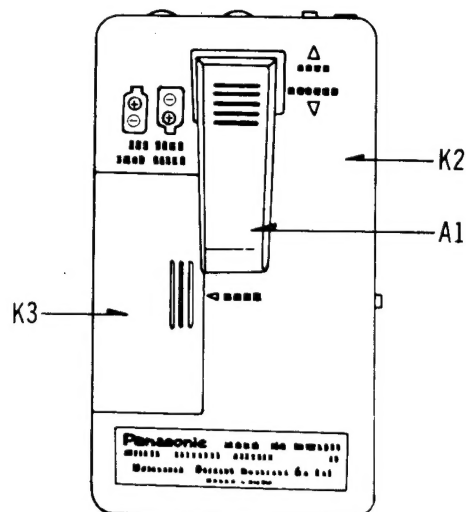
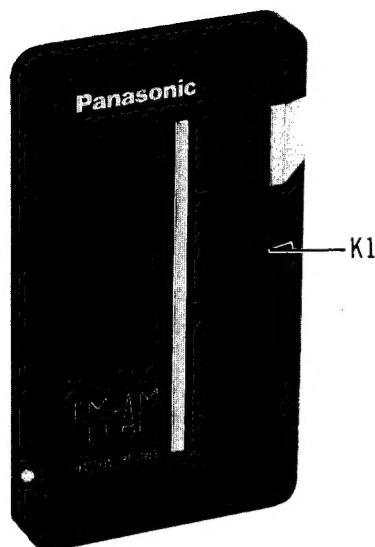
REPLACEMENT PARTS LIST

□ Indicates parts supplied by TAMACO.

Ref. No.	Parts No.	Parts Name & Description
INTEGRATED CIRCUITS, AND DIODES		
IC1	RVITA7358P	IC FM RF AMP
IC2 □	AN7025K	IC AM RF/FM AMP
IC3	TA7376P	IC Power AMP
D1 □	RVDL972HDSL	Diode
COILS AND TRANSFORMERS		
L1 □ [Z] [ZY]	RL04Y150-L	Antenna Coil FM
L1 □ [ZG]	RL04Y15	Antenna Coil FM
L2 □ [Z] [ZY]	RL04Y19-2	Oscillator FM
L2 □ [ZG]	RL04N221	Oscillator FM
L3 □	RLF2Y55	Antenna Coil AM
L4 □	RL02A25	Oscillator Coil AM
L5 □	RL0U100K	Choke Coil
L6 □	RLQZF100KV	Choke Coil
L7 □	RLQY50S5-0	Choke Coil
T1,3 □	RLI4A34	IFT, FM
T2 □	RLI2A42	IFT, AM
VARIABLE RESISTOR		
VR1	RVNCA14B4-L	V. R. FM VCO
VR2 □	RVV2H3A14	V. R. Volume Control
VARIABLE CAPACITOR		
VC1-4 □	RCV4LC4Q1Q	Tuning Capacitor, W/Trimmer Capacitor (CT1~4)
CERAMIC FILTER		
CF1 □	RVFSFE107MAZ	Ceramic Filter
CF2 □	RVFSFU459B	Ceramic Filter (AM)
COMPONENT COMBINATION		
Z1	EXCFF76108LM	Band Pass Filter
SWITCHES		
S1 □	RSS2A32WA-Q	Power Switch
S2 □	RSS3B35Y	Band Switch
JACK		
J1	RJJD3S5Z	Headphone Jack

Ref. No.	Parts No.	Ref. No.	Parts No.
RESISTORS		CAPACITOR	
R1.5	ERDS2TJ101	C1	ECCD1H101K
R2 [Z] [ZY]	ERDS2TJ222	C2,7,22,	ECKD1H102MD
R2 [ZG]	ERDS2TJ272	45	
R3	ERDS2TJ331	C5,21	ECCD1H050CC
R4,17	ERDS2TJ100	C6 [Z] [ZY]	ECCD1H150KC
R6	ERD10EJ222	C6,10 [ZG]	ECCD1H220KC
R7,22	ERDS2TJ151	C9	ECCD1H180KB
R10	ERDS2TJ682	C10 [Z] [ZY]	ECCD1H180KB
R11	ERDS2TJ222	C12,14	ECKD1H681KB
R12	ERDS2TJ121	C13 [Z] [ZY]	ECCD1H220KC
		C13 [ZG]	ECCD1H240JR
R8,13	ERDS2TJ152	C15	ECFZ1C473MDY
R15	ERDS2TJ822	C23,42,47	ECEA0GK221
R16	ERDS2TJ102	C24,25	ECFZ1C223MDY
R20,21	ERDS2TJ1R0	26,28	
R23	ERDS2TJ150	C27,39	ECEA0JK220
R24,25	ERDS2TJ2R7	C29	ECEA0GK470
		C30 [Z] [ZY]	ECKD1H102MD
		C30 [ZG]	ECKD1H471KB
		C31	ECFZD683MD
		C32,35,40	ECFZ1C153MD
		C33	ECKD1H471KB
		C34	ECEA1HK22R2
		C36	ECEA0GK330
		C37,38,	ECEA1HK010
		43,44	
		C41	ECQS05102KZ
		C46	ECEA1EK3R3
		C47	ECEA0GKA471
		C48	ECEA0JU471
		C49,50	ECFD1C104MD

CABINET AND ELECTRICAL PARTS LOCATION



REPLACEMENT PARTS LIST

☐ Indicates parts supplied by TAMACO.

Ref. No.	Parts No.	Parts Name & Description
CABINET PARTS		
K1☐	RKM264TZA	Front Cabinet
K2☐	RKF260TZA	Rear Cabinet
K3☐	RKK215TZ	Battery Cover
K4☐	RJC250TZ	Battery Terminal(+ · -)
K5☐	RJC251TZ	Battery Terminal(+)
K6☐	RJC252TZ	Battery Terminal(-)
K7☐	RBT220TZA-0	Knob, Volume
K8☐	RZAR423MKT	Dial Chassis Ass'y
K9☐	RDP233TZ	Pointer
K10☐	RDS205TZ	Dial Spring
K11☐	RDD210TZ	Dial Drum
K12☐	RDZ03TZA	Dial Cord
K13☐	XSH14+3	Screw (VR)
K14☐	XSH17+2	Screw
ACCESSORIES		
A1☐	RKH207TZ	Belt Clipper
A2☐	RPHV129JR	Innerphones Phone
A3☐	RQX751TZ	Instruction Manual
PACKING MATERIALS		
P1☐	RPK471TZ	Carton Box
P2☐	RPN1304TZ	Polyon
P3☐	RPN1337TZ	Pad
P4☐	RPP343TZA	Polyethylene Cover